

MECHANICAL SYMBOLS AND ABBREVIATIONS

ABBR.	SYMBOL	REMARKS	ABBR.	SYMBOL	REMARKS
		HORIZONTALLY MOUNTED SUPPLY AIR DIFFUSER/REGISTER/GRILLE	SA		SUPPLY AIR (* DUCT SIZE)
		HORIZONTALLY MOUNTED RETURN/EXHAUST AIR REGISTER/GRILLE	RA		RETURN AIR (* DUCT SIZE)
		VERTICALLY MOUNTED SUPPLY AIR DIFFUSER/REGISTER/GRILLE	EA		EXHAUST AIR (* DUCT SIZE)
		RECTANGULAR DUCTWORK SUPPLY/OUTSIDE AIR ELBOW	OA		OUTSIDE AIR (* DUCT SIZE)
		RECTANGULAR DUCTWORK SUPPLY/OUTSIDE AIR ELBOW	REL A		RELIEF AIR (* DUCT SIZE)
		ROUND DUCTWORK SUPPLY/OUTSIDE AIR ELBOW			SMACNA DUCT FABRICATION PRESSURE CLASS REQUIRED
		RECTANGULAR DUCTWORK RETURN AIR ELBOW			DUCT GRADUAL RISE OR DROP (IN DIRECTION OF AIRFLOW)
		ROUND DUCTWORK RETURN AIR ELBOW			90° ELBOW WITH DUOBLE THICKNESS TURNING VANES
		RECTANGULAR DUCTWORK EXHAUST/RELIEF AIR ELBOW			LONG RADIUS ELBOWS WITH CENTERLINE RADIUS = 1.5x DUCT DIMENSION IN PLANE OF TURN
		ROUND DUCTWORK EXHAUST/RELIEF AIR ELBOW			RECTANGULAR DUCT SIZE, FIRST NUMBER INDICATES SIZE FOR SIDE SHOWN
F		FIRE DAMPER - HORIZONTALLY MOUNTED			24x12
S		SMOKE DAMPER - HORIZONTALLY MOUNTED			24"
FS		FIRE/SMOKE DAMPER - HORIZONTALLY MOUNTED			24/12
F		FIRE DAMPER - VERTICALLY MOUNTED			FLAT-OVAL DUCT SIZE, FIRST NUMBER INDICATES SIZE FOR SIDE SHOWN
S		SMOKE DAMPER - VERTICALLY MOUNTED			DETAIL OR SECTION DESIGNATION (* DETAIL OR SECTION REFERENCE) (** SHEET NUMBER DETAIL OR SECTION DRAWN ON)
FS		FIRE/SMOKE DAMPER - VERTICALLY MOUNTED			NEW TO EXISTING DESIGNATION
VD		VOLUME DAMPER			EQUIPMENT DESIGNATION (* EQUIPMENT MARK NUMBER)
BGD		BLAST GATE DAMPER			REFERENCE DESIGNATION (* NOTE NUMBER)
AD		AUTOMATIC (MOTORIZED) DAMPER			MATCH LINE
DSD		DUCT MOUNTED SMOKE DETECTOR			DEMOLITION
		DUCT MOUNTED HUMIDIFIER			STAINLESS STEEL DUCTWORK
		SUPPLY AIR VALVE (SAV)			FLEXIBLE DUCT
		SUPPLY AIR VALVE WITH REHEAT COIL (SAV)			2-LINE SYMBOL
		EXHAUST AIR VALVE (EAV)			1-LINE SYMBOL
EA		EXHAUST AIR INLET			NEW DUCTWORK LAYER
RA		RETURN AIR INLET			DEMOLITION DUCTWORK LAYER
SA		SUPPLY AIR INLET			EXISTING DUCTWORK LAYER
TS		TRANSFER AIR			NEW PIPING LAYER
		MOISTURE TRANSMITTER			DEMOLITION PIPING LAYER
		THERMOSTAT OR TEMPERATURE SENSOR			EXISTING PIPING LAYER
		PRESSURE SWITCH OR PRESSURE SENSOR			
		CO=CARBON MONOXIDE DETECTOR CO2 = CARBON DIOXIDE SENSOR. ETO=ETHYLENE DIOXIDE SENSOR			
		COMBINATION HORN/STROBE			
		STROBE			
		HIGH LIMIT SWITCH			
		STATIC PRESSURE TRANSMITTER			
		HUMIDITY INDICATING TRANSMITTER			
		TEMPERATURE ELEMENT			
		PRESSURE SWITCH HIGH			
		DIFFERENTIAL PRESSURE TRANSMITTER			

ET	EXPANION TANK
AS	AIR SEPARATOR
H	HUMIDIFIER
ST	SOUND TRAP
SAV	SUPPLY AIR VALVE
EAV	EXHAUST AIR VALVE
AHU	AIR HANDLING UNIT
HRU	HEAT RECOVERY UNIT
EF	EXHAUST FAN
FCU	FAN COIL UNIT
PM	PUMP (MECHANICAL)
ETO	ETHYLENE OXIDE (STERILIZERS)
CFM	CUBIC FEET PER MINUTE
HWS	HEATING HOT WATER SUPPLY (REHEAT)
HWR	HEATING HOT WATER RETURN (REHEAT)
CHWS	CHILLED WATER SUPPLY
CHWR	CHILLED WATER RETURN
D	DRAIN
HPS	HIGH PRESSURE STEAM (50 PSIG)
LPS	LOW PRESSURE STEAM (15 PSIG)
HPR	STEAM CONDENSATE FROM HIGH PRESSURE STEAM
LPR	STEAM CONDENSATE FROM LOW PRESSURE STEAM
HRGS	HEAT RECOVERY GLYCOL SUPPLY
HRGR	HEAT RECOVERY GLYCOL RETURN
HGS	HOT WATER GLYCOL SUPPLY (PREHEAT)
HGR	HOT WATER GLYCOL RETURN (PREHEAT)
RPM	REVOLUTIONS PER MINUTE
GPM	GALLONS PER MINUTE
#/HR	POUNDS PER HOUR (STEAM FLOW)
PSIG	POUNDS PER SQUARE INCH GAUGE
FT.hd	FOOT HEAD (WATER SIDE PRESSURE DROP)
in. wc	INCH WATER COLUMN (AIR SIDE PRESSURE)
S.P.	STATIC PRESSURE
AFF	ABOVE FINISHED FLOOR
<b>AIR DEVICES</b>	
RR	RETURN OR EXHAUST REGISTER
SR	SUPPLY REGISTER
D	DIFFUSER
SW	SIDEWALL SUPPLY REGISTER
E	LOUVER
<b>AIR PIPING SYMBOLS</b>	
	SHUT-OFF VALVE (AS SPECIFIED FOR PIPE SIZE AND SERVICES)
	GLOBE VALVE
	CHECK VALVE
	FLOW SENSOR
	FLOW SENSOR / BALANCING VALVE
	BALANCE / SHUT-OFF VALVE (WITH MEMORY STOP)
	STEAM TRAP ASSEMBLY
	THERMOMETER
	PRESSURE GAUGES (USE WITH SIPHON LOOP ON STEAM APPLICATIONS)
	THERMOWELL
	PRESSURE / TEMPERATURE TEST FITTING (WITH CAP)
	STRAINER w/BLOWDOWN VALVE AND HOSE BIBB
	AIR VENT ('A' INDICATES 'AUTOMATIC')
	2-WAY CONTROL VALVE
	3-WAY CONTROL VALVE
	UNION
	FLANGES
	PIPE PITCHING DOWNWARD IN DIRECTION OF ARROW

MECHANICAL GENERAL NOTES:

- THIS CONTRACTOR SHALL COORDINATE SHUTDOWN OF ANY MECHANICAL SYSTEMS REQUIRED AS PART OF THE DEMOLITION WORK WITH THE VAMC PRIOR TO INTERRUPTION OF SERVICES.
- ALL EQUIPMENT, VALVES AND DAMPERS INSTALLED ABOVE CEILING SHALL BE ACCESSIBLE. COORDINATE REQUIRED LOCATIONS OF ACCESS PANELS IN HARD CEILING AND WALLS WITH ARCHITECTURAL CONTRACTORS FOR PROPER INSTALLATION.
- DAMAGE TO EXISTING MATERIAL AND/OR EQUIPMENT TO REMAIN SHALL BE REPAIRED OR REPLACED AT THE VAMC'S DIRECTION AT NO COST TO VAMC. DEMOLITION SHALL NOT AFFECT AREAS NOT INCLUDED IN DEMOLITION. CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTINUITY OF ALL SERVICES IN NON-DEMOLITION AREAS AND IN AREAS INDICATED TO REMAIN OPERATIONAL.
- REMOVE ALL EXISTING HANGERS, SUPPORTS, BRACING, ANCHORS, AND FASTENERS AT MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING TO BE DEMOLISHED.
- THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IMMEDIATELY IF ANY WORK INDICATED IN THE CONTRACT DOCUMENTS CANNOT BE PERFORMED DUE TO EXISTING FIELD CONDITIONS.
- IF ANY EXISTING FIREPROOFING OR FIRE ASSEMBLIES WHICH ARE REQUIRED TO REMAIN ARE DAMAGED DURING DEMOLITION THEY SHALL BE REPAIRED TO ORIGINAL CONDITION FIRE PROTECTION REQUIREMENTS. CONTACT THE ARCHITECT TO VERIFY U.L. ASSEMBLIES TO BE USED FOR REPAIRS.
- THE CONTRACTOR SHALL BRACE ALL EXISTING STRUCTURES AND ALL STRUCTURAL ELEMENTS AS NECESSARY DURING DEMOLITION.
- THE DRAWINGS ARE DIAGRAMMATIC. THE CONTRACTOR SHALL COORDINATE NEW MECHANICAL WORK WITH THE EXISTING CONSTRUCTION AND WITH WORK SHOWN ON THE ARCHITECTURAL, STRUCTURAL, PLUMBING AND ELECTRICAL DRAWINGS. COORDINATE THE LOCATION OF ALL ROOF OPENINGS AND ROOF MOUNTED EQUIPMENT WITH THE ARCHITECTURAL AND/OR STRUCTURAL DRAWINGS PRIOR TO INSTALLATION.
- THE CONTRACTOR SHALL PROVIDE ALL LABOR, FITTINGS, OFFSETS, TRANSITIONS, DAMPERS, VALVES, DEVICES, AND EQUIPMENT FOR A COMPLETE AND FULLY OPERATING HVAC SYSTEM(S).
- UNLESS NOTED OTHERWISE, DUCTWORK AND PIPING INDICATED FOR DEMOLITION SHALL BE REMOVED BACK TO THE NEAREST MAIN. MAIN (OR OTHER NOTED TERMINATION POINT) SHALL BE CAPPED AIR/WATER TIGHT. DUCTWORK AND PIPING WITHIN WALLS WHICH ARE TO REMAIN MAY BE CAPPED IN THE WALL AND ABANDONED WITHIN THE WALL. SERVICES MUST BE CAPPED FAR ENOUGH IN THE WALL TO ALLOW FOR FLUSH PATCHING AND FINISHING OF THE WALL.
- REFERENCE PLUMBING AND ELECTRICAL PLANS FOR COORDINATION WITH EXISTING PLUMBING AND ELECTRICAL UTILITIES TO REMAIN. PROVIDE PROTECTION DURING CONSTRUCTION FOR EXISTING UTILITIES TO REMAIN.
- CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS.
- FOLLOW VAMC'S PROTOCOLS AND PROCEDURES WHEN ENTERING AND WORKING WITHIN SPACES FOR DEMOLITION, NEW CONSTRUCTION, BALANCING WORK, ETC.
- ALL OUTAGES OF UTILITIES REQUIRED FOR ANY MECHANICAL WORK AFFECTING OTHER EQUIPMENT OR AREAS SHALL BE REQUESTED BY THE CONTRACTOR WITH VAMC FOR A MINIMUM OF 15 DAYS PRIOR TO THE SCHEDULED OUTAGE.
- ITEMS REQUIRING STORAGE DURING CONSTRUCTION, WILL BE STORED BY THE CONTRACTOR.
- COORDINATE WITH DIVISIONS 8 AND 9 FOR REQUIRED LOCATION OF ACCESS DOORS IN HARD CEILING. ACCESS PANELS IN HARD SUSPENDED CEILING ARE REQUIRED FOR ALL VALVES, TRAPS, DAMPERS, CLEANOUTS, CONTROLS, ETC. ACCESS PANELS SHALL BE FURNISHED AND INSTALLED UNDER THE ARCHITECTURAL SPECIFICATIONS.
- CONTRACTOR SHALL REPAIR OR REPLACE EXISTING OR NEW EQUIPMENT WHICH IS DAMAGED DURING CONSTRUCTION.
- SCHEDULE NET TAP CONNECTIONS IN ADVANCE WITH VAMC.
- ALL PIPING AND DUCTS IN FINISHED ROOMS OR SPACES SHALL BE CONCEALED IN A FURRED CHASE OR ABOVE THE HARD SUSPENDED CEILING.

DUCTWORK DEMOLITION GENERAL NOTES:

- WHERE EXISTING DUCTWORK IS NOT BEING RECONNECTED TO NEW DUCTWORK, TERMINATE WITH DUCT CAP, SEAL AIRTIGHT, INSULATE AND MATCH EXISTING FINISH. CAPS SHALL BE PROVIDED IMMEDIATELY AFTER DEMOLITION.
- WHERE DUCTWORK IS SHOWN TO BE DEMOLISHED, ALL ASSOCIATED CONTROLS, INSULATION, FIRE DAMPERS, SMOKE DAMPERS, EQUIPMENT, ETC SHALL BE REMOVED.
- ALL DUCTWORK TO REMAIN SHALL BE TEMPORARILY CAPPED IMMEDIATELY AFTER DEMOLITION TO PREVENT DIRT AND DEBRIS FROM ENTERING THE DUCT. FAILURE TO CAP OPENINGS SHALL RESULT IN CONTRACTOR CLEANING THE DUCT SYSTEM PRIOR TO RETURNING SYSTEM TO OPERATION.

DUCTWORK GENERAL NOTES:

- CONTRACTOR SHALL PROVIDE ALL SHEET METAL TRANSITIONS BETWEEN DUCTWORK COMPONENTS (AIR TERMINAL UNITS, REHEAT COILS, HOODS, ETC).
- ALL DUCTWORK IS TO BE TRANSITIONED TO THE ACTUAL HVAC EQUIPMENT OPENING(S). CONTRACTOR TO VERIFY AND CONFIRM ACTUAL EQUIPMENT OPENING SIZES PRIOR TO FABRICATION OF TRANSITIONS.
- THE FIRST FIGURE OF DUCT SIZE INDICATES DIMENSION OF FACE SHOWN OR INDICATED. DUCT SIZES ARE NET INSIDE DIMENSIONS.
- DIFFUSERS, REGISTERS AND GRILLE SIZES SHOWN ON FLOOR PLANS ARE NECK SIZES.
- REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATIONS OF CEILING DIFFUSERS, REGISTERS, AND GRILLES.
- PROVIDE SMACNA SEAL CLASS A.
  - ALL NEW DUCTWORK TO BE TESTED TO SMACNA PRESSURE.
  - MAXIMUM 5% TOTAL SYSTEM LEAKAGE.
  - EXISTING DUCTS (TO BE REUSED) TO BE TESTED TO +/- 6 INCHES PRESSURE, AND SEALED AS REQUIRED.

PIPING DEMOLITION GENERAL NOTES:

- WHERE EXISTING HOT WATER, CHILLED WATER, STEAM, CONDENSATE OR PUMPED CONDENSATE SUPPLY AND RETURN PIPES ARE NOT BEING RECONNECTED TO NEW EQUIPMENT, TERMINATE THE PIPES WITH VALVES AND PIPE CAPS, AND INSULATE AND FINISH TO MATCH EXISTING. CAPS SHALL BE PROVIDED IMMEDIATELY AFTER DEMOLITION.
- WHERE HEATING OR AC UNITS IN CEILING ARE TO BE DEMOLISHED THE ASSOCIATED ROOM THERMOSTAT AND CONTROLS SHALL BE REMOVED UNLESS NOTED OTHERWISE.
- WHERE PIPING IS TO BE DEMOLISHED, ALL ASSOCIATED SUPPORTS, PIPE HANGERS, INSULATION, ETC SHALL BE REMOVED.
- TOTAL STATIC PRESSURE NOTED IN THE SCHEDULES INCLUDES DUCT SYSTEM, TERMINAL UNITS, FILTERS, COILS, ETC.
- WATER PIPE CONNECTIONS TO AIR HEATING AND COOLING COILS SHALL BE MADE TO PROVIDE COUNTER FLOW BETWEEN WATER AND AIR.

PIPING GENERAL NOTES:

- PRIOR TO RECONNECTING THE HOT WATER SUPPLY AND RETURN PIPING OR STEAM SUPPLY AND CONDENSATE RETURN PIPING LOCATED IN THE CONSTRUCTION QUARANTIN BACK TO THE SYSTEM, ALL PIPING SHALL BE FLUSHED AND ALL STRAINERS INCLUDING THE EXISTING STRAINERS SHALL BE CLEANED. PROVIDE ALL NECESSARY FITTINGS AND VALVES TO FACILITATE THIS WORK. FOR TYPICAL STEAM AND WATER PIPING CONNECTIONS TO EQUIPMENT, SEE STANDARD EQUIPMENT DETAILS.
- UNLESS NOTED OTHERWISE, ALL HOT WATER OR STEAM SUPPLY AND RETURN OR CONDENSATE RUNOUTS TO HEATING EQUIPMENT SHALL BE 3/4".
- PROVIDE LABELS FOR EXISTING PIPE THAT REMAINS AND FOR NEW PIPING. OF THE PLASTIC FLEXIBLE TYPE, LETTER SIZE 1/2" TO 1-1/2" DEPENDING ON PIPE SIZE.
- ALL EXPOSED STEAM, CONDENSATE RETURN, VENTS, OR PUMPED CONDENSATE WHICH IS EXPOSED BELOW CEILING TO SERVE EQUIPMENT SHALL BE PROVIDED WITH ALUMINUM JACKETING, FOR A NEAT WATERPROOF INSTALLATION.
- PIPES SHALL NOT PASS ABOVE OR ENTER ELEC. IT, OR DATA CLOSETS UNLESS SERVING EQUIPMENT LOCATED IN AND DEDICATED TO THE RESPECTIVE ROOMS. AVOID RUNNING PIPES ABOVE PANELS OR ELECTRICAL EQUIPMENT.

PRE-CONSTRUCTION TESTING:

- PROVIDE PRE-CONSTRUCTION AIR LEAK AND PRESSURE TESTING ON EXISTING DUCTWORK TO BE REUSED IN 7TH FLOOR MECHANICAL ROOM AND SHAFT TO GROUND FLOOR FOR AHU-15, AHU-7, HRU-24/EF-11, EF-11A, EF-13 & EF-14. PRIOR TO TEST, THE CONTRACTOR IS TO DETERMINE THE INSTALLED DUCT RISER SMACNA PRESSURE CLASSIFICATION AND PROVIDE DUCT REINFORCEMENT TO ACHIEVE REQUIRED FINAL SMACNA PRESSURE FABRICATION CLASS, AND REQUIRED DUCT LEAK ALLOWANCE, AND SUBMIT FINDINGS AND RECOMMENDATION TO A/E FOR REVIEW PRIOR TO IMPLEMENTING ANY REMEDIAL WORK. AFTER REMEDIAL WORK IS APPROVED AND INSTALLED THE TEST EXISTING DUCT TO REQUIRED SMACNA PRESSURE CLASS, RECORD DUCT LEAKAGE AND SUBMIT REPORT ON THE RESULTS TO A/E PRIOR TO FABRICATION OF NEW CONNECTED DUCTWORK.

7.1 REFER TO DRAWING M600 FOR SMACNA FABRICATION

one eighth inch = one foot  
 one quarter inch = one foot  
 one half inch = one foot  
 three quarters inch = one foot  
 one inch = one foot  
 one and one half inches = one foot  
 two inches = one foot  
 three inches = one foot  
 three and one half inches = one foot  
 four inches = one foot  
 four and one half inches = one foot  
 five inches = one foot  
 five and one half inches = one foot  
 six inches = one foot  
 six and one half inches = one foot  
 seven inches = one foot  
 seven and one half inches = one foot  
 eight inches = one foot  
 eight and one half inches = one foot  
 nine inches = one foot  
 nine and one half inches = one foot  
 ten inches = one foot  
 ten and one half inches = one foot  
 eleven inches = one foot  
 eleven and one half inches = one foot  
 twelve inches = one foot

NO.	ISSUE FOR CONSTRUCTION REVISIONS	DATE
		07/25/2014

**CONSULTANTS:**

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Drawing Title  
**MECHANICAL SYMBOLS AND ABBREVIATIONS**

Approved: Project Director

Project Title  
**VA NY HARBOR HEALTHCARE SYSTEM MANHATTAN CAMPUS GROUND FLOOR PHASE 1B STERILE PROCESSING SUITE**

Project Number  
**219359**

Building Number  
**6**

Location  
**423 E 23RD STREET, NEW YORK, NY 10010**

Date  
**02/18/2014**

Checked  
**DS**

Drawn  
**DK**

Drawing Number  
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